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Employment and Wage Effects of Trade Liberalization

The Case of Mexican Manufacturing

Ana Revenga

Cuts in Mexico's tariff levels were associated with a slight decline in employment in Mexico and with increases in average wages (perhaps reflecting improved productivity in the reformed industries and a shift toward the use of more skilled workers). The wages and employment of skilled production workers were significantly more responsive to changes in protection levels than those of nonproduction workers.

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Summary findings

In 1985, after decades of an import-substitution industrial strategy, Mexico initiated a radical liberalization of its external sector. Between 1985 and 1988, import licensing requirements were scaled back to a quarter of earlier levels, reference prices were removed, and tariff rates on most products were substantially reduced. By 1989, Mexico was one of the most open economies in the developing world.

Adjusting to trade liberalization required the reallocation of resources between sectors and entailed substantial dislocation of workers. Revenga analyzes how Mexico's trade liberalization (1985–87) affected employment and wages in industry, focusing on how it affected average employment and earnings rather than on the link between trade and relative wages. She examines the tradeoff between wage and employment adjustment, identifies which labor groups benefited more from liberalization, and tries to associate changes in employment and wages directly with measures of change in trade protection, rather than link them to changes in imports and exports (which is more common).

She finds that reductions in quota coverage and tariff levels are associated with moderate reductions in firm-level employment. A 10-point reduction in tariff levels (between 1985 and 1990) is associated with a 2- to 3-percent decline in employment in Mexico.

Changes in quota coverage appear to have no discernible effect on wages, but reductions in tariff levels are associated with increases in average wages. This seems to reflect improved productivity in the reformed industries, which may be related to a shift toward the use of more skilled workers.

There seems to have been a slight shift in the skill mix in favor of nonproduction workers. This was paralleled by a sharper increase in the wage differential between skilled and unskilled workers. The wages and employment of skilled production workers were significantly more responsive to changes in protection levels than those of nonproduction workers — perhaps partly because production workers were more heavily concentrated in the industries in which protection levels were greatly reduced.

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EMPLOYMENT AND WAGE EFFECTS OF TRADE LIBERALIZATION: THE CASE OF MEXICAN MANUFACTURING

Ana Revenga

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I. Introduction

In 1985, after decades of pursuing an import-substitution industrialization strategy, Mexico initiated a radical liberalization of its external sector. The scope and speed of this trade liberalization episode is apparent from Table 1.[1] Between 1985 and 1988, import licensing requirements were scaled back to about a quarter of their previous levels, reference prices were removed and tariff rates on most products substantially reduced. By 1989, Mexico was one of the most open economies in the developing world.

Adjusting to this episode of trade liberalization required a substantial reallocation of resources between sectors of the Mexican economy. On the whole, the process was fairly smooth and its costs in terms of aggregate unemployment quite moderate: Mexico's unemployment rate rose to 4.4% in 1985, but was back down to 2.9% by 1989. One explanation for the absence of large aggregate employment effects was the flexibility demonstrated by real wages, which declined significantly throughout the adjustment period.

However, while on the aggregate the employment costs of the liberalization may have been fairly small, there is no doubt that at the sectoral level there was substantial dislocation of workers. Understanding how adjustment occurred at this level -- whether there was a tradeoff between employment and wage responses, and how this may have varied across sectors -- could provide essential insights as to the broader workings of the Mexican labor market. This seems particularly relevant in the wake of the implementation of the North American Free Trade Agreement (NAFTA), as further labor reallocation is expected.

Beyond its interest in relation to the potential effects of NAFTA, Mexico's recent trade liberalization experience can be relevant to many other developing countries embarking on a similar process. One of the key concerns regarding any liberalization episode is its potential effects on employment and wages in the affected sectors. Understanding what the employment costs were in the Mexican case, and how they may have been dampened, may thus provide some useful lessons.

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[1] For a careful account of the Mexican trade liberalization experience see Ten Kate (1992).

With these general objectives in mind, this study analyzes the impact of the Mexican trade liberalization of 1985-87 on employment and wages in the industrial sector. The paper examines the tradeoff between wage and employment adjustment, and analyzes whether certain groups of labor benefitted more, in relative terms, from the liberalization. The data used for the analysis are plant-level data drawn from the Annual Industrial Survey, and cover a panel of medium-to-large firms over the 1984-1990 period. These data were combined with import penetration ratios at the sector level, and with tariff-line and license-coverage data.

This paper is part of a new wave of interest in the Mexican labor market. Motivated partially by the U.S. literature on trade and rising inequality, a number of recent papers have investigated the impact of trade on the Mexican wage structure. Results so far are are fairly mixed: most coincide in finding a rising trend for wage inequality in Mexico, but differ widely when it comes to its explanation. Feliciano (1994), for example, uses household-level data to examine the effect of liberalization on the returns to schooling. She finds that wage differentials between skilled and unskilled workers increased between 1986 and 1990 and attributes this increase to trade reform. Craig and Epelbaum (1994) document a similar rise in earnings dispersion during the late 1980s, but associate it instead to a rise in the demand for educated workers resulting from the complementarity between skilled labor and investment in capital. Finally , Hansen and Harrison (1994) use both plant-level data and data from the Mexican Industrial Census to assess whether increased wage inequality in Mexico was linked to trade liberalization. They find little evidence of Stolper-Samuelson type effects, and conclude that changes in Mexico's wage structure are driven mostly by developments within industries.

This paper adds to the recent literature in several key aspects. First, it pays more explicit attention to employment developments. Second, unlike the other papers, it focuses on the impact of trade liberalization on average employment and earnings, rather than on the link between trade and relative wages. Third, it attempts to associate changes in employment and wages directly to measures of changes in trade protection, instead of linking them to changes in imports and exports, as has been more common.

The rest of the paper is organized as follows. Section II lays down the main model to be used as framework for the empirical analysis. Section III presents the data and some basic descriptive statistics. Section IV shows the main econometric results. Section V examines what has happened to skilled-unskilled wage differentials in response to trade liberalization. Finally, Section VI concludes.

II. Estimating the Impact of Trade on Employment and Wages

This section outlines a simple model in which nominal wages are predetermined by negotiation at the firm level, and employment is then set unilaterally by the firm after aggregate prices and demand levels are known. I begin by developing the analysis of employment determination, and then move on to consider how wages are set. This yields some simple reduced-form equations for employment and wages. I then consider how these equations may be extended to incorporate the effects of trade.

Employment

Assume that there are i identical firms in each industry, and that each has a constant returns to scale technology of the form:

$$y_{it} - k_{it} = \alpha[n_{it} - k_{it}] + \varepsilon_{it} \tag{1}$$

where y_{it} is the output of firm i in period t, k_{it} equals the capital stock of firm i in period t, n_{it} equals the firm's employment in that period, and ε_{it} is a productivity shock which is assumed to be serially uncorrelated. Note that all variables are expressed in terms of logarithms and that industry subscripts are ommitted for simplicity.

Assume also that firms produce differentiated products, and that, therefore, they face downward-sloping demand curves for their good. Let demand be allocated across firms as a function of relative prices:

$$y_{it}^{d} - y_{t}^{d} = -\eta[p_{it} - p_{t}] \tag{2}$$

where y_{it}^d represents demand for firm i's product in period t, y_t^d is total industry demand in period t, p_{it} is the firm-specific price, p_t is the average industry price, and η equals the price elasticity of demand.

Profit-maximizing firms will find it optimal to set prices as a markup over marginal cost:

(3) $$p_{it} = -\ln(\theta) + mc_{it} \quad with \theta = 1 - \frac{1}{\eta}$$

and where

(4) $$mc_{it} = w_{it} + \frac{(1-\alpha)}{\alpha}[y_{it}^d - k_{it}] - \frac{\varepsilon_{it}}{\alpha} - \ln(\alpha)$$

Combining equations (2), (3) and (4) yields the following price equation:

(5) $$p_{it} = -\ln(\alpha\theta) + w_{it} + \frac{(1-\alpha)}{\alpha}[-\eta(p_{it} - p_t) + y_t^d - k_{it}] - \frac{\varepsilon_{it}}{\alpha}$$

Equation (5) can then be combined with equation (1) to obtain an expression for firm-level employment:

(6) $$n_{it} = c + (\lambda - 1)k_{it} - \eta\lambda(w_{it} - p_t) + \lambda y_t^d - (\lambda - 1)\frac{\varepsilon_{it}}{\alpha}$$

$$where \quad c = \lambda\eta\ln(\alpha\theta)$$

$$\lambda = \frac{1}{\alpha + \eta(1-\alpha)}$$

Wage Determination

Assume that wage setting is decentralized, and that as in many standard union models, wage bargainers want to maximize the expected income of the representative worker. The union, thus, sets real wages so as to maximize an objective function of the type:

(7) $$\max V = \pi(w) \cdot w + (1 - \pi(w)) \cdot w^A$$

subject to employment being on the labor demand curve. Note that $\pi(w)$ equals the probability that the representative worker will be employed in firm i the following period (which is a decreasing function of the negotiated wage), and w^A represents the "fall-back" or alternative real wage (ie. the wage the worker will receive if he/she gets laid off).

If we assume that the union's target employment level is simply the employment level in the previous period, n_{it-1}, we can write the objective function as:[2]

(8) $$\max \frac{n_{it}(w_{it})}{n_{it-1}} \cdot w_{it} + \frac{n_{it-1} - n_{it}(w_{it})}{n_{it-1}} \cdot w_{it}^A$$

The standard solution to this type of bargaining model is of the form:[3]

(9) $$-\zeta(w_{it} - w_{it}^A) = (n_{it} - n_{it-1})$$

where ζ is the wage elasticity of labor demand. Adding and subtracting k_{it} to the right-hand side, and then substituting in from equation (6) for $(n_{it} - k_{it})$ gives us an expression for the negotiated wage:

[2] We are assuming that the union cares only about the interests of workers who are currently employed (ie. its objective is to maintain employment at current levels). This is consistent with the popular "insider-outsider" type of models which have been developed to explain the persistence of European unemployment (see, for example, Lindbeck and Snower (1988); Layard, Nickell and Jackman (1991), Dolado and Bentolila (1992)).

[3] See, for example, Layard, Nickell and Jackman (1991), De Lamo and Dolado (1991) or Dolado and Bentolila (1992).

(10)

$$w_{it} = c\sigma + \sigma w_{it}^{A} + \lambda\sigma y_t^d - \sigma n_{it-1} - (\lambda - 1)\sigma k_{it} + \frac{(\lambda - 1)\sigma}{\alpha}\varepsilon_{it}$$

$$with \sigma = \frac{1}{(\zeta + \eta\lambda)}$$

We now have an expression for firm-level employment (eq. 6) and firm-level wages (eq. 10). The next step is to introduce tariffs and quotas into our framework, so as to obtain expressions that allow us to relate employment and wages to trade liberalization measures.

Introducing Licensing and Tariffs

The two key elements of Mexican trade policy prior to the liberalization were a system of quantitative restrictions encompassing both quotas and licenses, and an *ad valorem* import tariff scheme .[4] We consider the modeling of each in turn.

In analyzing the impact of QRs we distinguish between licensing of imported intermediate inputs, and that of final output. As regards the former, we can model the reduction of import restrictions as the release of a binding constraint on one factor, in our case k_{it}. Using equations (1), (3) and (4) we have:

(11)

$$y_{it} = \bar{k}_{it} + \frac{\alpha}{1 - \alpha}\left[p_{it} - w_{it}\right]$$

where $\bar{}$ denotes the constrained factor. It is then clear that a reduction in licensing of intermediate inputs should increase output and, to the extent that labor and the constrained input are complements in the production process, should also lead to an increase in the amount of labor employed.

[4] These two instruments were complemented by a set of official minimum prices for custom valuation. However, in this paper we ignore the role of these reference prices. For a description of the Mexican trade policies and their evolution through the 1980s, see Ten Kate (1992).

We then turn to the impact of import licensing on final output. Assume that domestic and foreign goods are imperfect substitutes, so that demand is a function of relative prices. And let δ represent the coverage of the quantitative import restrictions. We can then express the fraction of total domestic demand for an industry's good that is allocated to domestic producers in terms of relative prices and the coverage of the import restrictions. Letting lower case letters denote logaritms,we have:

(12) $$y_t^d - d_t^d = \ln(1-\delta) + \theta[\tilde{p}_t - p_t]$$

where d^d_t reflects total domestic demand for the industry's good, (1-δ) is the fraction of total demand not covered by restrictions, and ~p is the price of the import good which, in turn, is assumed to be given by:

(13) $$\tilde{p}_t = p_t^* \cdot (1 + tariff_t)$$

with p^* equal to the world price of the import good.

Making use of equations (11) through (13), we can rewrite our employment and wage equations (6) and (10) as:

(14)
$$n_{it} = a_0 + a_1(r_{it} - p_{it}) - a_2(w_{it} - p_t) + a_3(v_{it} - p_t) +$$
$$b_1[d_t^d + \ln(1 - lcq_{it}) + \theta \ln(1 + tariff_{it}) + \theta(p_t^* - p_t)] + c_1 \ln(lci_{it}) + \varepsilon_{it}$$

with $a_1+a_2+a_3=0$, and

(15)
$$w_{it} = a_0\sigma + \sigma w_{it}^A + a_1\sigma(r_{it} - p_t) + a_3\sigma(v_{it} - p_t) +$$
$$b_1\sigma[d_t^d + \ln(1 - lcq_{it}) + \theta \ln(1 + tariff_{it}) + \theta(p_t^* - p_t)] - \sigma n_{it-1} + c_1\sigma \ln(lci_{it}) + v_{it}$$

where $(r_{it}-p_t)$ is the user cost of capital, $(v_{it}-p_t)$ is the real price of materials, lcq_{it} reflects the coverage of quotas or licenses on output, and lci_{it} reflects the coverage of licenses on inputs.

Equations (14) and (15) can be estimated jointly using Generalized Least Squares (GLS).

III. Data Description and Basic Statistics

The data used in the empirical analysis are drawn from the plant-level Annual Manufacturing Survey. The sample covers the period 1984-1990 and includes, within each sector, all plants sorted by decreasing order of size to account for roughly 80% of cumulative value added. Out of the 3218 plants included in the original survey, 2354 were selected for the analysis.[5] A very similar dat set has been used to study the impact of the liberalization on productivity and performance, by Tybout and Westbrook (1992), and by Grether (1993). The latter provides, in an appendix, a detailed description of the variables included in the survey and of their construction.[6]

The plant-level data were combined with measures on tariff rates, and license coverage on inputs and output calculated by the Mexican Trade Ministry (SECOFI), and with import penetration ratios at the 3-digit sector level.[7] Since the survey data do not include price variables, these were taken from more aggregated sources. Producer-prices were obtained at the 4-digit Mexican sectoral classification level and merged with the firm data. An aggregate wholesale price index, and a price index for raw materials were also added. Finally, we

[5] Observations dropped included: (a) those with zero or negative values for gross output, value added and total costs; (b) those presenting large, erratic changes from year to year in the key variables; and (c) those with extreme values for some of the essential variables relative to other plants in the same sector.

[6] One important characteristic of the sample is that it is closed --ie. only plants with observations for every year of the sample period are included. This could introduce a potentially important selectivity bias into our analysis, since neither firms entering or exiting a sector during this period would be captured in the sample. Unfortunately, I was not able to obtain the complete unbalanced panel.

[7] Import penetration ratios at the 3-digit ISIC level were available for 1984-87. Similar ratios at the 2-digit level were available for the complete sample period, 1984-90.

incorporated two alternative measures for the "fallback" wage. One is the average wage in the state, which was drawn from the Industrial Census for several years. The other one is the official minimum wage.

Means and standard deviations of the key variables are presented in Table 2. These averages confirm that the sample comprises primarily large plants, although there is clearly substantial variation both between and within industries. It is interesting that, despite the trade liberalization measures, the mean import penetration ratio actually declined between 1984 and 1987. This reflects the fact that the impact of the liberalization was intentionally delayed by a sharp 27% real depreciation of the peso in 1985 and 1986 (see Ten Kate, 1992). By 1987, however, the depreciation had been reversed and the impact of the trade reforms began to bite. Between 1987 and 1990, the mean import penetration ratio practically doubled, increasing from 8.7% to 16.2%.

Table 3 presents means and standard deviations for log changes in the key variables over the 1984-1986 and 1986-1990 periods. The table subdivides the sample into three groups of industries according to their initial protection levels, and presents separate statistics for each subgroup. To define the three industry categories, I first ranked industries by initial protection levels (tariffs plus quotas): the top third was classified as high initial protection industries (roughly those with quotas close to 100 percent of production and tariffs of above 40 percent); the second third as medium initial protection (quotas of above 80 percent and tariffs of between 20 and 40 percent); and the bottom third as low initial protection (for details on each 3-digit industry see Table 5).

The two phases of the liberalization process are clearly apparent from Table 3. During the first phase, 1985-86, import quotas were removed and substituted for tariff-equivalents. Accordingly, there were small overall reductions in average tariffs (of approximately -1.3 percentage points) but large decreases in quota coverage (on average of -67.2 percent). In the second phase, tariff levels were brought down and remaining quotas removed. The largest overall declines in protection rates occurred in those sectors which had previously been less exposed to import competition. However, the pattern of liberalization differed somewhat between industries: those classified as initially highly protected faced significantly smaller declines in quota coverage during the first round of reforms and larger ones during the second

round than did the other sectors. Tariff reductions, on the other hand, were larger for the initially protected sectors throughout the whole period.

Between 1984 and 1986, real output fell significantly in all industries, as did real wages. The evolution of employment was somewhat more mixed: some sectors experienced stagnant employment or even employment reductions, while others saw their employment levels grow. Output recovered following the reforms, growing on average by nearly 4 percent. However, sector performance diverged considerably, with the initially more-open industries showing stronger growth. For the period as a whole (1984-90), industries classified as initially more protected experienced lower employment growth over the period (measured both in terms of workers and total hours), as well as sharper real wage declines.

The statistics presented in Table 3 suggest that both the magnitude of trade reform and its impact have differed significantly across industries, with the initially highly protected sectors bearing the largest adjustment burden. In order to understand how trade reform may have played itself out through the Mexican labor market, the next step is to examine the characteristics of the more affected sectors. Table 4 ranks 3-digit industries by descending level of protection, and presents some basic statistics by industry.

Several features stand out from this table. First, industries with high initial protection levels tended to be lower wage and more labor intensive than those with less protection.[8] Sectors such as ceramics, apparel, footwear and furniture, for example, were among the most protected, while industries like chemicals, steel and non-electrical machinery were relatively more open. The rank correlation between total levels of initial protection and real wages is -0.52 (significant at the .05 level), confirming that sectors with relatively low wages initially had higher tariff rates and import quotas. Second, import penetration was significantly lower in highly-protected, labor-intensive industries than in more open, capital-intensive sectors. In 1984, import penetration rates in ceramics, apparel and footwear were all under 3 percent. In contrast, imports accounted for 20 percent of total consumption (output plus imports) in chemicals, 31 percent in non-electrical machinery, and as much as 60 percent in electrical machinery. Third, relative prices have fallen more in those sectors that experienced larger

[8] This is consistent with Feliciano's findings that workers in highly protected industries had lower education and skills, and were paid less than those in less protected sectors.

trade reform: the rank correlation between changes in relative prices and changes in tariff levels is -0.57 (significant at the .01 level), and the correlation between changes in relative prices and changes in total protection (including removal of quotas) is -0.46 (significant at the .05 level). Import shares have also increased slightly more in the large reform industries: on average, import shares rose by 4 percentage points among the high reform industries and by 3 percentage points among the low reform ones. Import penetration in apparel, for example, increased from 2.9 percent in 1984 to 8.6 percent in 1990. Similarly, import shares increased from 5.3 percent to 11.4 percent in glass products, from 1.9 percent to 9.7 percent in textiles and from 1.6 percent to 5.1 percent in footwear.

These overall patterns suggest a link between reduction in protection rates, increased import competition, and employment and wage adjustment. This is supported by the correlations presented in Table 5, which show a negative, although weak, correlation between changes in import shares and changes in employment for the post-reform period. The data show a similarly weak, negative correlation between changes in import penetration and output, but a positive correlation between the former and real wages. The next section explores these associations further in the econometric analysis.

IV. Results

The empirical results are based on the estimation of equations (14) and (15) described above. The dependent variable in equation (14) is annual employment, measured both in terms of average workers over the year and total hours worked. The independent variables include the user cost of capital, the price of raw materials, the real hourly product wage,[9] and the protection rate variables: (a) the fraction of demand not covered by import restrictions (ie. the inverse of the license coverage of output), (b) the average tariff rate at the end of the year, and (c) the license coverage of inputs. All variables are expressed in logarithms, and all nominal variables are deflated by the producer price index. To proxy for the evolution of total demand for the industry's good, we have included industry-specific trends into our estimating equations.[10] We also include year effects to control for common aggregate shocks that are not

[9] Because of potential measurement problems with the hours variable, I also tried using annual income rather than hourly wages as an independent variable. The results obtained were similar to those presented here.

[10] In lieu of interactions between industry and year dummies.

otherwise captured by our specification. In addition, to allow for the possibility of slow employment adjustment, we consider an alternative specification that includes lagged employment among the right-hand side variables.

The bargaining model developed in section II would suggest that the appropriate wage to use in equation (15) would be the real consumer wage --the nominal wage deflated by the consumer price index. However, for consistency with the employment equation we have opted for using the real product wage in this equation as well. The independent variables are the alternative or "fallback" wage (defined as in section III), employment lagged one period, the user cost of capital, the price of raw materials, and the protection variables. As in the employment equation, we include an industry-specific trend and year effects. We also allow for a lagged dependent variable term. Again, all variables are expressed in logarithms.

Results are presented in Table 6. This table shows both simple unconstrained OLS estimates obtained by estimating the employment and wage equations separately, and also those obtained from estimating the two equations jointly by GLS. The OLS results for employment levels are presented in columns (1) and (2), while those for hours are shown in columns (3) and (4). OLS estimates for the hourly wage equation are presented in columns (5) and (6). Joint estimates for the employment and wage equations are given in columns (7) and (8), while joint estimates for the hours and wage equations are shown in columns (9) and (10). Both sets of estimates --OLS and GLS-- are very similar.

As regards the employment equations, we obtain fairly reasonable estimates for factor elasticities. The coefficient on the wage rate in the employment equation is negative and significant, although as is often the case in employment demand equations it is very low. It is significantly larger in the hours equation. Since we do not attempt to instrument for the real wage in either case, these coefficients are probably downward biased. Although we do not impose the constraint, the estimates are consistent with the restriction that the elasticities of employment with respect to the three factor prices sum to zero.

With respect to the protection variables, our estimates are again quite reasonable. We obtain a negative and significant coefficient on the variable that captures the fraction of demand not covered by import restrictions. This suggests that an increase in the fraction of

the market not covered by restrictions (that is, a reduction in coverage levels) lowers employment both in terms of workers and hours. Interestingly, the impact on number of employees is quite similar to the impact on hours, suggesting little change in the amount of hours worked per employee.[11] Note that since all variables are entered in logarithms, the coefficient must be interpreted as an elasticity.

The coefficient on tariff rates is, as we would expect, positive and significant. Hence, a reduction in tariff rates is associated with a reduction in employment levels and total hours worked. Again, the impact on both employment levels and hours worked are fairly similar. Finally, with respect to licensing on inputs, we obtain a negative and significant estimate, suggesting an effect that goes in the opposite direction from that of licensing on output: a reduction of restrictions on imported inputs, appears to have a positive effect on employment.

My results for employment contrast strongly with those obtained by Feliciano (1994), who does not find an impact of trade liberalization on industry-elevel employment. However, Feliciano (1994) is analyzing total employment at the industry level, while I examine firm-level employment.[12] Oks (1993) has suggested that much of the improvement in productivity following the reforms has occurred through within-industry changes in employment. Hence, the effects of trade liberalization may not show up in net industry employment. Moreover, Feliciano's employment regressions do not control for what happened to wages. If industries experiencing large tariff reductions offered larger wage declines, the effects on employment may have been dampened. Without controlling for wage developments, it may be hard to isolate the impact of the changes in protection levels.

In both the worker and hours equations, the lagged dependent variable term appears large and strongly significant. We interpret this as a sign of sluggish employment adjustment, which is consistent with the existence of substantial employment protection. In any case, it

[11] This finding contrast strongly with the experience of, for example, European countries, in which much of adjustment to demand shocks appear to occur via changes in hours worked rather than via changes in employment levels. See Abraham and Houseman (1993).

[12] Note also that Feliciano (1994) uses employment data from the National Accounts. These data may differ significantly from those of the Manufacturing Survey because they reflect estimates of employment based on the national account output data, rather than actual employment levels.

suggests that the dynamics of the equations are important. However, because of the limited time-period spanned by our sample, we have not experimented with longer lags.

The results for the wage equations are also quite satisfactory. The coefficients on both the alternative wage and on lagged employment appear to be correctly signed and are significant. The results for the protection variables are a bit more mixed, but nevertheless reasonable. When the lagged real wage is ommitted from the specification, both the tariff rate variable and the license coverage on imports come in as negative and significant. The coefficient on licensing of output, on the other hand, is insignificant. Although the results weaken somewhat once a lagged dependent variable is included in the specification, the signs remain the same.

The estimates suggest that a reduction in tariff rates is associated with an increase in real wages. A priori, one may have expected the sign to go the other way, under the assumption that workers appropriate part of the rents created through tariff protection.[13] But this does not seem to be the case. This finding is reinforced by the zero coefficent on licensing of output. If workers had been able to appropriate part of the rents created by the existence of quotas, you would expect their removal to be associated with a decline in real wages.

One interpretation of the finding that tariff reductions are associated with increased real wages is that it reflects an increase in labor productivity in response to the trade reforms.[14] A complementary explanation is that the skill mix of employment may be changing. If lower skill or less senior workers were laid off in response to the reforms, tariff reductions would then be associated with an increase in the average wage (and also with an increase in average productivity).

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[13] Revenga (1993) finds that in the U.S., increases in import competition are associated with small, but statistically significant real wage declines, and that these declines are larger in highly unionized industries, in which workers had presumably been more able to appropriate rents.

[14] Combined with the result on employment, this finding suggests that a reduction in tariffs is associated with a (simultaneous) reduction in employment levels and increase in wages.

As with tariffs, the reduction in the licensing of inputs appears to be linked to an increase in real wages. Again, this could reflect an improvement in productivity, resulting from the release of the input constraint that allows the firm to use more (imported) capital and/or other intermediate inputs, or from a change in the skill mix of employment toward more skilled workers.

To test whether the negative sign on the tariff variable is explained by productivity increases, I estimate a version of equation (15) with value added per worker (as a proxy for productivity) entered as a right-hand side variable. Because of the potential endogeneity of the productivity variable, it is entered lagged one period. This equation can be interpreted as a reduced-form for wages that takes into account productivity changes. Results are shown in Table 7. As far as the employment and hours equations are concerned, adding value added per worker to the equation does not greatly alter the estimated coefficients for the protection variables. The results for the wage equation are somewhat more interesting, particularly those in column (6), which includes the lagged real wage as a independent variable. As expected, lagged value added per worker enters positively in the regression indicating a relationship between higher productivity and higher real wages. The coefficient on the portion of domestic demand not covered by quotas is negative and significant, suggesting that a reduction in quotas (an increase in the fraction of the market not covered by restrictions), holding productivity constant, reduces real wages. This is consistent with workers having appropriated some part of the quota rents prior to liberalization. Note, however, that although significant the coefficient is very small, not quite -0.01. The coefficient on tariffs remains negative, but becomes insignificant once the lagged dependent variable is included in the regression. This finding can be taken as weak evidence that the link between tariff reductions and wage increases works through productivity.

V. Trade Liberalization and Skilled-Unskilled Wage Differentials

The finding that tariff reductions are associated with increases in average wages, suggests that the skill composition of employment in Mexican manufacturing may be shifting towards more-skilled or more-senior workers. This would be consistent with the increase in skill differentials documented by Feliciano (1994), Craig and Epelbaum (1994) and Hansen

and Harrison (1994) among others. Unfortunately, the enterprise data do not provide very adequate measures of the skill composition of employment. It is possible, however, to control for the mix of production versus non-production workers, and to interpret changes in this mix as changes in the skill composition of the workforce.

Table 8 presents the ratio of production workers to total employment over the 1984-90 period, for all industries and by initial protection categories. It is interesting to note that the ratio is highest in the high initial protection industries, precisely in those which experienced the largest reforms. This is consistent with Feliciano's (1994) finding that large-reform industries employed proportionally more low-skilled workers than did small-reform ones. Similarly, the proportion of production workers to total employment is smallest in the originally low initial protection (or small-reform) industries.

For manufacturing as a whole, the fraction of production workers in total employent has decreased slightly over the period, which could indicate a shift towards more skilled workers. This change in composition towards less use of production workers is fairly visible for the medium and low initial protection industry categories. However, among the high initial protection industries the shift in skill mix has been negligible. What is much more striking than the change the employment mix is the dramatic increase in the skilled-unskilled wage differential; an increase that is apparent among all industry groups. The ratio of the average hourly non-production to production wages increased from 2.115 in 1984 to 2.711 in 1990. The skill wage differential has increased the most among the large reform industries (those with high levels of initial protection).

Table 9 presents the results obtained from estimating separate employment and wage equations for production and non-production workers. Since one would expect employment (and wages) for production and non-production workers to be simultaneously determined, the equations are estimated jointly using Generalized Least Squares.

The coefficients presented in Table 9 are fairly similar to those estimated from the single aggregate regression. The results suggest that production worker employment is more responsive to changes in protection levels than that of non-production workers. The estimated elasticity of production worker employment with respect to a change in tariff levels is 0.27,

whereas that for non-production employment is 0.14. The results also suggest that the wage elasticity of employment is larger for production workers than for non-production employees.

The wages of non-production workers do not appear to be very responsive to changes in protection levels, whereas those of production workers do seem to respond. Reductions in quota coverage of imported inputs are associated with increases in production worker wages, perhaps reflecting increases in productivity resulting from greater access to imported capital and/or other inputs. Reductions in tariff levels are, again, associated with higher wages, suggesting that the production/non-production breakdown is not sufficient to control for changes in the skill mix of employment.

The fact that production worker employment is more responsive to tariff changes than non-production employment could possibly be explained by the fact that the former are more highly concentrated in the those industries that experienced large declines in protection. To explore this hypothesis, I examine what happened within industries. I run separate employment and wage equations by industry category. I find that in all three industry categories employment and wages of production workers are substantially more responsive to changes in protection levels than those of non-production workers. I also find, however, bigger responses among the industries that experienced greater reform (namely those with high or medium levels of initial protection). Hence, the aggregate results appear to be driven both by differences in responsiveness within industries (with production workers being more affected by reform) and by cross-industry variation in the skill mix.

VI. Conclusions

This paper has analyzed the impact of trade liberalization on employment and wages in Mexican manufacturing using a panel data set of firms for the 1984-90 period. The paper finds that reductions in quota coverage and in tariff levels are associated with moderate reductions in firm-level employment. According to the results of this paper, a 10 point reduction in tariff levels, such as that experienced by Mexico between 1985 and 1990, is associated with a 2-3% decline in employment. Changes in quota coverage appear to have no discernible effect on wages. But reductions in tariff levels are associated with increases in average wages. This

last result seems to reflect productivity increases in the reformed industries, which may be related to changes in the composition of labor towards higher-skilled workers.

The data suggest that there has been a slight shift in the skill mix in favor of non-production workers. This has been paralled by a much sharper increase in the skilled-unskilled wage differential. When equations are estimated separately for production and non-production workers, the paper finds that employment and wages of the former are significantly more responsive to changes in protection levels than those of the latter. This should be atributed, in part, to the fact that production workers are more heavily concentrated in the industries that underwent large reductions in protection levels.

Table 1

Mexico: Trade Protection in Manufacturing, 1985-89

	1985:VI	1986:VI	1987:VI	1988:VI	1989:VI	1990:VI
Avg. Tariff[a] (% ad valorem)	23.5	24.0	22.7	11.0	12.6	12.5
Maximum Tariff	100.0	45.0	40.0	20.0	20.0	20.0
Coverage of Import Licensing[b]	92.2	46.9	35.8	23.2	22.1	19.9
Coverage of Reference Prices[b]	18.7	19.6	13.4	0.0	0.0	0.0

[a] Production-weighted. Does not include the uniform 5% surcharge that was abolished in December, 1987.
[b] Average share of output subject to import licensing or reference prices, as a percentage of total domestic output.

Source: Hufbauer and Schott (1992), Grether (1993).

Table 2

Sample of Mexican Manufacturing Firms, 1984-90

Means (s.d.) of Key Variables

	1984	1987	1990
Total Employment	331.7	334.8	352.7
	(636.9)	(637.1)	(688.4)
Production Workers	231.7	231.9	245.3
	(489.0)	(487.6)	(529.2)
Non-production Workers	99.8	102.6	106.2
	(173.9)	(179.8)	(189.8)
Real Gross Value Output	370.5	411.9	437.4
(millions of 1980 MEX$)	(888.9)	(1117.8)	(1257.0)
Real Value Added	156.1	171.3	182.9
(millions of 1980 MEX$)	(361.6)	(428.1)	(478.5)
Real Monthly Wage	6981.4	6445.4	6835.4
(1980 MEX$)	(2942.6)	(2920.5)	(3548.7)
Production Workers	5461.2	4932.4	4701.4
	(2173.8)	(1969.8)	(2134.8)
Non-Production Workers	10,353.5	9652.0	11,502.6
	(6046.4)	(4736.9)	(6855.7)
Import Penetration Ratio (%)	12.7	8.7	16.2
(2-digit)	(16.1)	(11.5)	(15.2)

Table 3
Long Period Changes:
Means of Log Changes by Initial Protection Level[a]

1984-1986

Log Change in:	All	Low IP	Medium IP	High IP
Total Employment	0.016	0.026	0.007	0.009
	(0.389)	(0.245)	(0.215)	(0.245)
Total Hours Worked	0.014	0.031	0.010	0.017
	(0.428)	(0.295)	(0.229)	(0.287)
Real Gross Value Output	-0.054	-0.042	-0.080	-0.042
	(0.377)	(0.400)	(0.347)	(0.380)
Real Hourly Wage	-0.053	-0.050	-0.064	-0.046
	(0.247)	(0.271)	(0.207)	(0.257)
Import Penetration Ratio[b]	0.004	0.002	0.006	0.005
	(0.029)	(0.042)	(0.024)	(0.011)
Average Tariff[b]	-1.31	7.260	1.595	-13.583
	(15.1)	(9.929)	(6.869)	(17.854)
Domestic Production covered by Import Licenses[b]	-67.2	-71.785	-77.930	-51.315
	(37.2)	(30.749)	(27.673)	(46.150)

1986-1990

Log Change in:	All	Low IP	Medium IP	High IP
Total Employment	0.008	0.019	0.027	0.001
	(0.521)	(0.375)	(0.361)	(0.342)
Total Hours Worked	0.022	0.034	0.041	0.011
	(0.530)	(0.408)	(0.392)	(0.374)
Real Gross Value Output	0.037	0.040	0.077	-0.002
	(0.517)	(0.517)	(0.511)	(0.519)
Real Hourly Wage	-0.021	0.021	-0.039	-0.050
	(0.247)	(0.301)	(0.336)	(0.317)
Import Penetration Ratio[b]	0.031	0.028	0.030	0.035
	(0.059)	(0.074)	(0.054)	(0.042)
Average Tariff[b]	-17.31	-9.787	-17.456	-25.314
	(9.3)	(7.748)	(7.716)	(4.307)
Domestic Production covered by Import Licenses[b]	-24.1	-10.759	-17.189	-45.565
	(36.5)	(23.204)	(27.527)	(45.595)

[a] Industries ranked by total protection levels in 1984. Top third classified as high initial protection (quotas of close to 100 percent of production and tariff rates above 40 percent); middle third classified as medium protection (quotas of 80-100 percent of production and tariffs of 20-40 percent); bottom third classified as low protection.

[b] Changes in import penetration, average tariffs and coverage of import restrictions in levels.

Table 4

Protection Rates, Import Ratios and Hourly Wages by Industry, 1984[a]

3-digit industry (isic)	Tariff Rate (%)	License Coverage (%)	Import Share (%)	Real Hourly Wage[b]	ΔRelative Price[c] 1984-90	ΔReal Wage[d] 1984-90	ΔEmployment[d] 1984-90
Beverages (313)	81.7	100	0.4	33.79	-0.08	-0.056	0.16
Glass products (362)	60.0	100	5.3	42.74	-0.47	0.094	0.10
Ceramics (361)	50.0	100	2.2	35.40	0.67	-0.027	0.26
Tobacco (314)	50.0	100	0	35.15	-0.09	-0.132	-0.12
Apparel (322)	50.0	100	2.9	26.17	0.01	-0.102	-0.001
Furniture (332)	48.9	100	1.0	27.31	0.01	-0.111	0.04
Wood products (331)	44.7	100	2.1	30.92	0.03	-0.185	-0.04
Footwear (324)	42.0	100	1.6	26.97	-0.003	-0.102	-0.22
Nonmet minerals	42.8	98.8	2.1	32.95	-0.06	0.017	-0.02
(369)	40.9	100	3.1	39.30	-0.24	-0.152	0.16
Misc. goods (390)	37.4	98.9	11.0	36.34	0.01	-0.121	-0.02
Pulp, paper (341)	31.2	100	3.9	53.86	0.03	-0.191	-0.02
Tires and tubes (355)	32.4	98.4	5.8	47.97	-0.10	0.056	0.13
Pharmaceuticals	39.8	89.6	12.0	35.06	-0.29	-0.072	0.02
(352)	36.6	85.3	1.9	35.30	-0.14	-0.153	-0.05
Metal Products (381)	26.7	94.7	16.1	39.61	-0.20	-0.124	0.17
Textiles (321)	21.3	100	2.4	29.62	-0.14	-0.023	0.18
Transport equip.	40.8	80.3	3.2	38.32	-0.31	-0.128	-0.02
(384)	20.7	100	0.9	34.71	-0.41	0.137	0.00
Food products (311)	30.1	90.5	10.1	30.82	-0.01	-0.061	0.09
Printing, publish.	27.1	90.2	60.3	44.16	0.02	-0.062	0.09
(342)	13.5	100	23.3	58.90	-0.10	-0.186	0.38
Misc. foods (312)	23.7	89.8	26.4	44.61	0.39	-0.021	-0.002
Plastics (356)	9.2	95.8	9.3	43.85	-0.34	-0.165	-0.20
Electrical mach. (383)	19.5	85.1	20.2	50.59	-0.12	0.109	0.13
Misc. chemicals (354)	22.0	76.0	31.1	44.38	-0.15	-0.058	0.08
Non-ferr metals (372)							
Iron and steel (371)							
Basic chemicals (351)							
Non-elec mach (382)							

[a] Unweighted averages by industry. [b] In 1980 Mex$. [c] Change in industry price relative to aggregate. [d] Log changes 1984-1990.

Industries sorted by descending order of total protection (tariff + license coverage).

Table 5

Long Period Changes:
Correlations of Log Changes

1984-1986

	dEMP	dMR	dGVO	dRHWAGE	dTARIFF	dLCQ
dEMP	1.00	-0.001	0.175	-0.025	-0.026	0.023
dMR		1.00	-0.021	0.035	-0.088	0.023
dGVO			1.00	0.037	-0.076	0.049
dRHWAGE				1.00	-0.014	0.009
dTARIFF					1.00	-0.506
dLCQ						1.00

1986-1990

	dEMP	dMR	dGVO	dRHWAGE	dTARIFF	dLCQ
dEMP	1.00	-0.015	0.343	-0.021	-0.010	0.074
dMR		1.00	-0.057	0.010	0.051	-0.023
dGVO			1.00	0.074	-0.031	0.044
dRHWAGE				1.00	0.120	-0.002
dTARIFF					1.00	-0.076
dLCQ						1.00

dEMP = change in log total employment
dMR = change in import penetration ratio (2-digit)
dGVO = change in log gross value of output
dRHWAGE = change in log real hourly wage
dTARIFF = change in ad valorem tariff rate
dLCQ = change in fraction of domestic production covered by output licenses.

Table 6
Employment and Wage Equations

Ordinary Least Squares

Independent Variable (all in logs)	Employment		Hours		Hourly Wage	
	(1)	(2)	(3)	(4)	(5)	(6)
Hourly Wage	-.077	-.036	-.209	-.107	–	–
	(.015)	(.009)	(.016)	(.009)		
Alternative Wage	–	–	–	–	.231	.057
					(.008)	(.005)
Cost of Capital	.528	.149	.546	.164	.104	.034
	(.003)	(.003)	(.004)	(.003)	(.003)	(.002)
Price Raw Materials	-.410	-.129	-.394	-.120	-.109	-.033
	(.024)	(.014)	(.024)	(.015)	(.013)	(.008)
1 - LCQ	-.156	-.045	-.128	-.036	-.001	-.007
	(.012)	(.007)	(.013)	(.008)	(.007)	(.004)
1 + Tariff	.225	.075	.196	.066	-.076	-.010
	(.016)	(.010)	(.016)	(.010)	(.009)	(.005)
LCI	-.105	-.026	-.100	-.029	-.017	-.001
	(.006)	(.003)	(.005)	(.003)	(.003)	(.001)
Lagged Employment[b]	–	.753	–	.741	-.016	-.018
		(.005)		(.005)	(.004)	(.003)
Lagged Hourly Wage	–	–	–	–	–	.773
						(.006)
Industry Trend	.413	.099	.604	.170	.290	.070
	(.011)	(.006)	(.010)	(.007)	(.008)	(.006)
Year Effects	yes	yes	yes	yes	yes	yes
R^2	.976	.991	.982	.993	.987	.995

[a] Obtained by estimating eqs. (14) and (15) in the text. Standard errors in parenthesis. LCQ=license coverage on output. LCI=license coverage on inputs.
[b] Lagged dependent variable: employment in (1) and (2), hours in (3) and (4).

Table 6 (cont)
Employment and Wage Equations

Joint Estimation (GLS)

Independent Variable (all in logs)	Emp.	Wage	Emp	Wage	Hours	Wage	Hours	Wage
	(7)		(8)		(9)		(10)	
Hourly Wage	-.130	–	-.035	–	-.245	–	-.108	–
	(.015)		(.009)		(.016)		(.010)	
Alternative Wage	–	.222	–	.231	–	.231	–	.231
		(.008)		(.008)		(.008)		(.008)
Cost of Capital	.534	.109	.149	.105	.550	.108	.164	.105
	(.004)	(.003)	(.003)	(.003)	(.004)	(.003)	(.004)	(.003)
Price Raw Materials	-.417	-.102	-.129	-.109	-.398	-.111	-.120	-.109
	(.024)	(.013)	(.014)	(.013)	(.024)	(.013)	(.015)	(.013)
1 - LCQ	-.159	.036	-.045	-.001	-.128	-.002	-.036	-.001
	(.013)	(.007)	(.007)	(.007)	(.013)	(.007)	(.008)	(.007)
1 + Tariff	.224	-.078	.076	-.076	.194	-.074	.067	-.076
	(.016)	(.009)	(.010)	(.009)	(.016)	(.009)	(.010)	(.009)
LCI	-.106	-.014	-.026	-.017	-.101	-.017	-.029	-.017
	(.006)	(.003)	(.003)	(.003)	(.006)	(.003)	(.003)	(.003)
Lagged Employment[b]	–	–	.753	-.016	–	–	.740	-.016
			(.005)	(.004)			(.005)	(.004)
Industry Trend	.438	.308	.098	.290	.621	.293	.170	.290
	(.011)	(.009)	(.007)	(.008)	(.011)	(.008)	(.007)	(.008)
Year Effects	yes	yes	yes	yes	yes	yes	yes	yes
RMSE	.734	.414	.437	.394	.737	.394	.452	.394
χ^2	10.439	10.439	0.004	0.004	5.323	5.323	0.009	0.009

[a] Obtained by estimating eqs. (14) and (15) in the text jointly via GLS. Standard errors in parenthesis.
[b] χ^2 test for independence of the employment and wage equation residuals.

Table 7
Reduced-Form Employment and Wage Equations with Lagged Value Added per Worker
Ordinary Least Squares

Independent Variable (all in logs)	Employment		Hours		Hourly Wage	
	(1)	(2)	(3)	(4)	(5)	(6)
Hourly Wage	.040	-.005	-.100	-.077	–	–
	(.015)	(.008)	(.016)	(.008)		
Alternative Wage	–	–	–	–	.184	.055
					(.007)	(.005)
Cost of Capital	.547	.130	.560	.142	.052	.027
	(.004)	(.003)	(.004)	(.003)	(.003)	(.002)
Price Raw Materials	-.420	-.109	-.428	-.119	-.076	-.031
	(.022)	(.011)	(.022)	(.012)	(.012)	(.008)
1 - LCQ	-.133	-.029	-.116	-.025	-.007	-.009
	(.012)	(.006)	(.012)	(.006)	(.006)	(.004)
1 + Tariff	.204	.060	.185	.053	-.047	-.006
	(.015)	(.007)	(.014)	(.008)	(.008)	(.005)
LCI	-.087	-.016	-.086	-.020	-.034	-.006
	(.006)	(.003)	(.005)	(.003)	(.003)	(.002)
Lagged Employment[b]	–	.802	–	.789	.012	-.014
		(.004)		(.004)	(.004)	(.003)
Lagged Hourly Wage	–	–	–	–	–	.741
						(.006)
Lagged Value Added per Worker	-.154	-.043	-.129	-.033	.194	.038
	(.008)	(.004)	(.008)	(.004)	(.004)	(.003)
Industry Trend	.412	.074	.609	.143	.343	.091
	(.011)	(.006)	(.010)	(.006)	(.008)	(.006)
Year Effects	yes	yes	yes	yes	yes	yes
R^2	.984	.996	.987	.997	.989	.995

[a] Obtained by estimating eqs. (14) and (15) in the text. Standard errors in parenthesis. LCQ=license coverage on output. LCI=license coverage on inputs.

[b] Lagged dependent variable: employment in (1) and (2), hours in (3) and (4).

Table 8

Ratio of Production Workers to Total Employment

Year	All Industries	High initial protection	Medium initial protection	Low initial protection
1984	.694	.732	..678	.676
1985	.697	.735	.681	.678
1986	.688	.728	.672	.670
1987	.685	.726	.668	.666
1988	.684	.725	.666	.664
1989	.683	.727	.663	.662
1990	.684	.732	.665	.661

Skilled-Unskilled Wage Differentials

(Ratio of wage of non-production workers to wage of production workers)

Year	All Industries	High initial protection	Mdium initial protection	Low initial protection
1984	2.115	1.976	2.116	2.241
1985	2.241	2.234	2.217	2.269
1986	2.099	2.088	2.031	2.173
1987	2.061	2.052	2.042	2.087
1988	2.214	2.190	2.262	2.191
1989	2.471	2.633	2.328	2.461
1990	2.711	2.956	2.567	2.629

Table 9

Employment and Wage Equations, Production vs. Non-Production Workers[a]

Variable	Employment		Wages	
	Production	Non-Production	Production	Non-Production
Production Wage	-.105 (.021)	.308 (.023)	--	.938 (.010)
Non-Production Wage	-.041 (.016)	-.051 (.017)	.544 (.006)	--
Cost of Capital	.517 (.004)	.541 (.005)	.018 (.002)	.040 (.003)
Price Raw Materials	-.405 (.026)	-.408 (.029)	-.063 (.011)	.021 (.014)
Alternative Wage	--	--	.065 (.007)	.034 (.009)
1 - LCQ	-.131 (.014)	-.102 (.015)	-.010 (.005)	.011 (.007)
1 + Tariff	.273 (.017)	.138 (.019)	-.040 (.007)	.010 (.009)
LCI	-.128 (.006)	-.048 (.007)	-.015 (.003)	.001 (.003)
Lagged Employment[b]	.781 (.005)	.782 (.005)	-.005 (.003)	-.006 (.004)
Industry Trend	.357 (.012)	.142 (.014)	.083 (.007)	.107 (.009)
Year Effects	yes	yes	yes	yes
RMSE	.810	.866	.332	.435
χ^2	4185.9			

[a] Equations estimated jointly via GLS. Standard errors in parenthesis.

[b] χ^2 test for independence of the residuals.

Table 10

Employment Equations By Initial Protection Group

Variable	High initial protection		Medium initial protection		Low initial protection	
	Prod	Non-Prod	Prod	Non-Prod	Prod	Non-Prod
1-LCQ	-.109 (.022)	-.079 (.023)	-.162 (.037)	-.219 (.039)	-.058 (.029)	-.072 (.031)
1+Tariff	-.190 (.073)	.149 (.078)	.358 (.058)	.199 (.062)	.075 (.026)	.112 (.028)
LCI	.008 (.013)	.053 (.015)	-.161 (.015)	.017 (.016)	-.164 (.008)	-.133 (.009)

Equations also include the cost of capital, the intermediate input price, the own firm-specific wage, lagged employment, an industry-specific trend, and year dummies. Standard errors in parenthesis.

Wage Equations By Initial Protection Group

Variable	High initial protection		Medium initial protection		Low initial protection	
	Prod	Non-Prod	Prod	Non-Prod	Prod	Non-Prod
1-LCQ	-.022 (.009)	-.010 (.012)	.017 (.017)	.033 (.022)	-.021 (.013)	-.047 (.017)
1+Tariff	-.081 (.033)	-.196 (.044)	-.064 (.027)	-.061 (.034)	-.030 (.011)	.027 (.016)
LCI	-.066 (.006)	-.034 (.008)	-.003 (.007)	.003 (.009)	-.021 (.004)	-.035 (.005)

Equations also include the cost of capital, the intermediate input price, the alternative wage, lagged employment, an industry-specific trend, and year dummies. Standard errors in parenthesis.

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